



National Resources Inventory

2002 Annual NRI

Introduction

April 2004

Seven Decades of Resource Inventories

Throughout its history, NRCS has conducted periodic inventories of the Nation's natural resources. The 1945 Soil and Water Conservation Needs Inventory (CNI), a reconnaissance study, was the foundation for the 1958 and 1967 CNIs, the agency's first efforts to collect data nationally for scientifically selected field sites. The 1975 Potential Cropland Study focused on identifying lands best suited for cultivation.

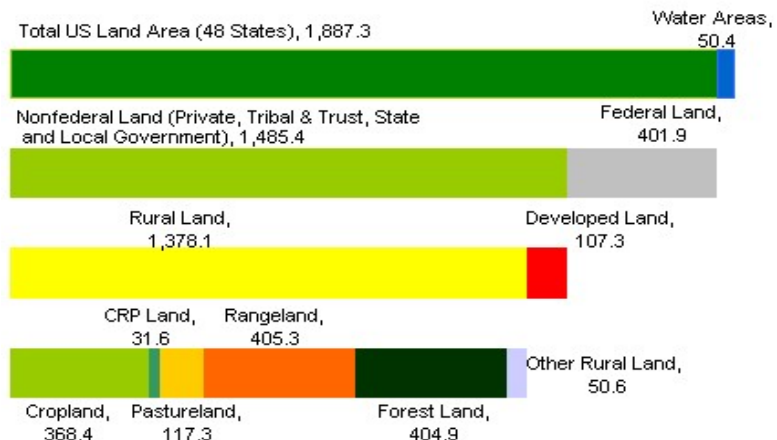
The National Resources Inventory (NRI) was first conducted in 1977, and every 5 years thereafter through 1997. Several less intensive, special-issue inventories also were performed during the 1990s to investigate topical matters of concern and to supplement the NRI. The Annual NRI introduces the newest stage of NRCS natural resource inventory activity.

Information about the condition of the land and related natural resources is needed at many different scales to inform decision makers. The U.S. Department of Agriculture (USDA) gathers data and information through a variety of efforts such as farmer and rancher surveys, censuses, and natural resource surveys. These efforts culminate in a variety of databases, assessments, publications, and other products—useful for many purposes and at many levels—that help to inform the public, from land users and local governments to national policy makers.

The National Resources Inventory

- The National Resources Inventory (NRI) is a statistical survey designed to help gauge natural resource status, conditions, and trends on the Nation's nonfederal land - nonfederal land includes privately owned lands, tribal and trust lands, and lands controlled by State and local governments.
- The NRI is conducted by the Natural Resources Conservation Service (NRCS) in cooperation with Iowa State University's Center for Survey Statistics and Methodology.
- The NRI is carried out under the authority of a number of legislative acts including the Rural Development Act of 1972, the Soil and Water Resources Conservation Act of 1977, the Federal Agriculture Improvement and Reform Act of 1996, and the Farm Security and Rural Investment Act of 2002.

Surface Area of the Contiguous United States, 2002
Millions of Acres



The Annual NRI

- The NRI was conducted every 5 years during the period 1977 to 1997, but is now conducted annually. This shift helps align the NRI with the need for timely information to support agricultural and conservation policy development and the assessment of the impacts of policy choices and conservation program implementation.
- The design challenge for the Annual NRI was to ensure continuing capacity for long-term trend analyses, while accelerating the acquisition and delivery of new information on natural resource conditions and trends.
- For the Annual NRI, data are gathered for a scientifically selected subset of the 800,000 sample sites that were established for previous NRIs. This sub-sample includes a set of "Core" sample sites, which are sampled each year, and "Rotation" (or "supplemental") sample sites that vary by inventory year and allow an inventory to focus on emerging issues. Additional on-site data gathering is conducted for items that cannot be determined remotely, to establish baseline conditions, and for quality assurance purposes.
- Transition to a fully implemented Annual NRI is taking place over several years. In 1999 and 2000, baseline data were gathered at Core sample sites; these data were used during preparation of the statistical database for the 2001 Annual NRI. In 2001, data were gathered from approximately 200,000 Core and Rotation sample sites.
- The 2002 Annual NRI is the second of the Annual NRI releases. Results are being released in two phases - the first phase provides estimates on [Land Use](#) and [Wetlands](#) status and trends on nonfederal lands in the contiguous United States. The second phase will provide additional estimates on land use, erosion, and land use conversions.
- Subsequent Annual NRIs will provide a broader spectrum of results - additional topics, and estimates at additional geographic levels. Estimates will be released when they meet statistical standards and are scientifically credible in accordance with NRCS policy and Office of Management and Budget and USDA Quality of Information Guidelines.

What to Look for in the Future

- The Annual NRI continues to build a database that will provide estimates of the same extent and scale as the 1997 Foundation NRI. At the same time, the inventory will increase the breadth of analyses it supports, for example providing data to assist in determining the environmental benefits of conservation programs and activities.
- The scale of NRI estimates is affected during the transition to full implementation of the Annual NRI approach. It will take a number of years before the Annual NRI provides reliability levels comparable to those of the 1997 NRI. Importantly, reliability at the state and sub-state levels will not be reached simultaneously because of differences in sampling needs.

- The 2002 Annual NRI included nearly 150,000 sample sites where data were gathered from July 2002 through March 2003. Results will be presented at national and some regional levels.
- The 2003 Annual NRI included about 200,000 sample sites. Data were gathered between June 2003 and February 2004. Data are going through quality assurance and other statistical processing steps. National, regional, and some state-level status estimates will be available in 2005.
- Sample sizes for the 2004 and 2005 Annual NRIs will be similar to the sample for the 2003 NRI. The 2005 NRI reliability level should approach that of the 1997 NRI, with the exception that many sub-state level trend estimates still will have unacceptable levels of statistical uncertainty.
- Future NRIs will address an increasing number of issues of national significance, for example:
 - **Conservation Benefits.** The annual NRI will provide updates on resource condition on an annual basis, which can contribute to more timely evaluation of the environmental benefits of conservation programs and activities. In 2003, the NRI began supporting a detailed, large scale assessment of the environmental benefits of conservation practices and programs. Additional site-specific data on farming, conservation practices, and program participation will be gathered for selected NRI sample sites. Reporting will begin with national level benefit estimates focused on water quality, water use conservation, soil erosion, soil quality, and carbon sequestration associated with cultivated cropland and cropland enrolled in the Conservation Reserve Program. As additional data are collected and modeling capabilities increase, assessments will provide regional level estimates and include a broader range of land uses and benefits, such as air quality and wildlife habitat.
 - **Grazing Lands.** Nonfederal grazing land - rangeland, pastureland, and grazed forest land - accounts for about 578 million acres, or nearly 30 percent of the contiguous United States (see [Land Use](#) Module). Since the mid-1990s, NRCS, in cooperation with other agencies, has been developing new field-based rangeland inventory protocols in order to improve the information available on rangeland condition. These new protocols were introduced as part of the 2003 Annual NRI. Data collected during 2003, 2004, and 2005 will be assimilated and assessed to provide National and regional level estimates on the condition of rangeland ecosystems. Field-based inventory protocols for pastureland and grazed forest land are under development and will be introduced in future Annual NRIs.
 - **Soil Quality.** The NRI includes data on soil type, soil characteristics, and soil interpretations, in addition to historical information on land use, management practices, and erosion. These data, along with historical climate data, are being used to assess soil quality by deriving a Soil Conditioning Index (SCI) value for each NRI sample site. The SCI quantifies the effects of

cropping sequences, tillage, and other management inputs on soil organic matter content, which serves as an indicator of soil quality. Soil quality has direct implications for agricultural productivity, erosion potential, and potential for impacts on associated air and water resources. Future Annual NRI results will present long-term trends in soil quality.

About the Inventory Process

- NRI data are collected at scientifically selected sample sites. NRI uses a stratified two-stage unequal probability area sample. The first stage sample unit - primary sample unit (PSU) - is an area or segment of land. The second stage of sampling is one or more points within the PSU.
- Sample sites are located in all counties and parishes of the 50 states and in Puerto Rico, the Virgin Islands, the District of Columbia, and selected portions of the Pacific Basin. The 1997 NRI gathered data from 800,000 points in 300,000 primary sample units (PSUs).
- Detailed NRI data are collected for the specific sample points, but some items are also collected for the entire PSU/segment. Some data, such as total surface area, federally owned land, and area in large water bodies, are collected on a census basis external to the sample survey.
- Data are collected for PSUs using photo-interpretation and other remote sensing methods and standards. Data gatherers also use ancillary materials such as USDA field office records, information from NRCS field staff, soil survey and other inventory maps and reports, and tables and technical guides developed by local field office staffs.
- The NRI approach to conducting inventories facilitates examining trends over time because the same sample sites have been studied since 1982, the same data have been collected since 1982 [definitions and protocols have remained the same], and quality assurance and statistical procedures are designed/developed to ensure that trend data are scientifically legitimate and unambiguous. Data undergo rigorous quality review and a statistical estimation procedure that assigns weights to sample points based on sampling (selection) probabilities, estimates from previous NRIs, and known land base attributes from the Census Bureau and other sources.
- Results calculated from the NRI database produce estimates - not absolute facts. This is because the results are tabulations of NRI sample data as opposed to data from a census or a direct measurement. Thus, proper interpretation of NRI results requires an understanding of the inventory procedures and the amount of uncertainty associated with each estimate. *Margins of error* (at the 95 percent confidence level) are reported for all NRI estimates.
- The precision of NRI estimates depends upon the number of samples within the region of interest, the distribution of the resource characteristics across the region, the sampling procedure, and the statistical estimation techniques. Characteristics that are common and spread fairly uniformly over an area can be estimated more precisely than characteristics that are rare or unevenly distributed.

More Information

For more information about the NRI, visit,
<http://www.nrcs.usda.gov/technical/NRI/>

See the 2002 NRI Glossary for definitions of key terms:
<http://www.nrcs.usda.gov/technical/land/nri02/glossary.html>

To obtain State and local 1997 NRI data, contact your NRI coordinator. Links to State NRI websites and contact information can be found at:
http://www.nrcs.usda.gov/technical/NRI/1997/obtain_data.html

Send comments and questions to the NRI Help Desk, nri@nhq.nrcs.usda.gov